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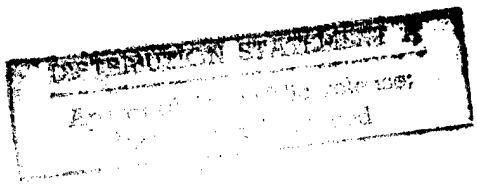
4 September 1985

West Europe Report

SCIENCE AND TECHNOLOGY



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WEST EUROPE REPORT

SCIENCE AND TECHNOLOGY

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ADVANCED MATERIALS

PECHINEY ENTERS HIGH-TECH CERAMICS FIELD, MARKET HOPES

Paris AFP SCIENCES in French 13 Jun 85 p 51

[Article: "Pechiney Enters the Electronic Ceramics Field"; for related information see JPRS-WST-85-021, 12 July 85 p 39]

[Text] Paris--Pechiney just started producing high-technology ceramics for advanced electronic components, supercomputers and spacecraft, Mr Richard Armand, head of the Metals and New Materials branch of the nationalized group, announced on 11 June in Paris.

The company just created a subsidiary called Xeram, 95 percent of whose stock is held by Pechiney and 5 percent by Eurofarad, a company specialized in the interconnection of several ceramic layers, a method that provides for data transport from one component to another.

Eurofarad, which employs 1,000 people, is granting Xeram an exclusive license on its patents. Xeram will direct its efforts to high-integration (VLSI) silicon circuits and gallium arsenide circuits.

Pechiney expects to get 60 percent of the French market in this field by 1990 and 30 percent of the European market which, according to Pechiney, should then represent some FF 300-500 million. The group is negotiating with U.S. and Japanese companies to establish plants in these two countries and get at least 5 percent of their markets.

In addition, the group is showing interest both for the European Eureka project and for the U.S. Strategic Defense Initiative, both of which have a new-materials component. "We were not contacted for the U.S. project, nor did we receive any instructions from the ministry not to take part in it," Mr Roland Cauville, head of another Pechiney subsidiary specialized in new materials, stated.

Pechiney's new-materials operations as a whole employ 250 people for sales of FF 100 million, which could rise to FF 300 million by 1990, when the world market is expected to experience strong growth.

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ADVANCED MATERIALS

FRENCH FIRMS IN JOINT CARBON-COMPOSITES VENTURE

Paris LE FIGARO in French 7 Jul 85 p 15

[Article by Anne Salomon: "Alsthom-SEP: Carbon for Two"]

[Text] The Alsthom group is creating a joint subsidiary with the European Propulsion Company [SEP] to develop composites for aeronautical and automotive applications.

Certainly, a lot is going on in the field of new materials. After Pechiney and Eurofarad in electronic ceramics, SEP and Alsthom are now partners in a joint subsidiary: Carbon Industry. As its name indicates, the company is going to fabricate a carbon-carbon composite material which, for the time being, is used for brake parts on aircraft and formula-one cars.

But for the time being only, since another goal of SEP's partnership with Alsthom is to give SEP access to the market of the TGV [Very-High-Speed Train] on which SNCF [French National Railroads] is now testing SEP products. It is said that with these products it will gain at least 600 kg per axle.

SEP is very eager and hopes to be represented on the Atlantic TGV. According to Roger Lesgards, SEP chief executive officer, the production or Carbon Industry would then rise from a 50-ton capacity to 200 or even 300 tons. Some bound on a world market of 1,000 tons this year. Surprise? True, 1,000 tons may not be much, but at FF 2,000 per kg that may be enough for the highly sophisticated applications for which it is presently used.

Carbon Industry will benefit from FF 100 million in investments over the next 3 years. In a first stage, the production capacity of its plant, now under construction at Villeurbanne, will be 30 tons, but it should be increased to 50 tons by 1990.

These figures should be compared with those of SEP, which produced 6 tons in 1984 and should reach 15 tons by the end of this year.

The transition from 15 to 30 tons in 1986 is therefore not insignificant, although Alsthom and SEP consider that these are only "conservative prospects." In other words, their projected investment plans probably extend beyond the year 2,000.

This is all the more likely as Pierre Betin, SEP general manager, is already painting the bright future of the carbon-carbon composite when it will cost only FF 1,500 per kg in 1990, or even FF 1,000 by the end of the century.

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AEROSPACE

BRIEFS

NEW ESA DIRECTORATES ESTABLISHED--On 13 June, in Paris, the European Space Agency (ESA), which is reorganizing to control key European space programs, announced that it was creating three new directorates for earth observation and microgravity, for telecommunications and for the Columbus pressurized module. Mr Philip Goldsmith (Great Britain) is thus placed in charge of the earth observation and microgravity program, two fields in which observers agree that commercial services will soon become available. Mr Giorgio Salvatori (Italy) is appointed director of the telecommunications program, a sector where commercial services have been available for years and in which the ESA is working on new technologies. Finally, the Columbus pressurized module program, which might represent the European contribution to the U.S. space station planned for 1992, will be headed by Dr Fredrik Engstrom (Sweden). [Text] [Paris AFP SCIENCES in French 20 Jun 85 p 36] 9294

'AIR CUSHIONS' FOR ARIANE--The Europa rocket Ariane is lifting off even faster and more reliably into the heavens than ever before. A German-French joint operation of a special type is making this possible. At Kourou, the Ariane launching site in French Guyana, there has been constructed under contract to the European aeronautics authority a turntable having a carrying capacity of 640 metric tons. The required equilibrium of the turntable is guaranteed by the use of air cushions which have been developed by the French firm of Bertin, located in Plaisir. At each point of rotation the four successive air cushions maintain the turntable at precisely equal levels. The rotary motions are synchronized by a velocity control. The firing platform on which stands the upright rocket is transported on a 1-km-long double rail. The air cushions guarantee the precise positioning of the firing equipment together with the rocket within millimeter accuracy. [Text] [Duesseldorf VDI NACHRICHTEN in German 12 Apr 85 p 28] 8008

CSO: 3698/604

COMPUTERS

FRENCH AI LAB STUDIES INTERPRETING APPLICATION LANGUAGES

Paris INDUSTRIES & TECHNIQUES in French 10 Mar 85 p 175

[Article by Mirel Schere: "Paris-8 Artificial Intelligence Institute: Interpreting Application Languages"]

> [Text] The Laboratory's pride, the VLisp system has been installed on numerous machines, in the United States as well as in Great-Britain and Canada. Next goal: testing future data-gathering models.

Artificial intelligence has now become a fad and is trying hard to come out of the laboratory and get into industry. Just take a look at the 1984 market: $137 million, nickels and dimes compared with the $100 billion spent on data processing as a whole. In addition, the few hundred high-level artificial intelligence researchers to be found worldwide, and whom the industry is trying to monopolize, cannot meet the huge demand for basic research. Yet there is no lack of efforts.

Thus, at the Artificial Intelligence Institute of the Paris-8 University, a young team headed by Patrick Greussay has been carrying out very interesting research of worldwide reputation on that subject for the past few years. "Our main research theme on tools is the creation of application-language interpreter architectures. Specifically, Lisp, its derivatives, specialized processors, its environments and programming tools and, of course, all their applications to artificial intelligence."

A Language and Programming-Environment Interpreter in Ultra-Portable Form

During the past three years, for instance, the team developed the VLisp system that gave rise to numerous applications. Indeed, implantations on a wide variety of machines, such as the PDP10, PDP11, Solar, 8080, Prime, 8086, 68000, Vax, Perkin-Elmer and Z8000, have appeared, to mention hardware only.

The geographic distribution of these implantations is quite as varied. The system was implemented in many public laboratories: LITP [Theoretical Data-Processing and Programming Laboratory], Orsay LRI [expansion unknown], Polytechnic School, School of Mines, Programming Institute, IRCAM [expansion unknown], Marcoussis laboratory of the CGE [General Electricity Company],

INRIA [National Institute of Data-Processing and Automation Research] Kayak Project, Grenoble IMAG [Data Processing and Applied Mathematics], GRECO CNRS [Coordinated Research Group of the National Center for Scientific Research] at the Bordeaux University. Abroad, the system was transported to and used at the Stanford Research Institute, at the artificial intelligence laboratory of the Stanford University (United States), at the Open University and at the Essex University (Great-Britain), and quite recently at the Montreal University (Quebec).

These versions have been used for extremely varied applications, from expert systems to office automation and including musical data processing. A major innovation of VLisp, according to P. Greussay, resides in the iterative interpretation of post and co-post recursive procedures. This is a characteristic that is regularly mentioned in specialized books. Recently, the team became interested in redefining the architecture of the VLisp interpreter, orienting it toward portability (i.e. its reimplantation in C language under Unix Version 7, System 3 and Berkeley), its extensions to process control, the incorporation of highly advanced editing tools (interactive multi-window editors), and finally integration with Prolog-type languages. Already in 1982-1983, the team created a new version of VLisp, called LovLisp, which achieved the integration of Lisp and Prolog. It is now used at the Programming GRECO, at the LITP and at the Paris-7 and Paris-8 Universities.

But if Prolog Version 1 and VLisp are now fully integrated, the same work remains to be done for Version 2, and as a result the team will redesign the memory organization of a Lisp system.

"In the past year," P. Greussay confided, "we have studied and completed the implantation of the Scheme language (the lexical version of Lisp) which we believe successfully integrates the post-recursive interpretation, exhaustive compilation and processor architecture aspects. In addition, it also includes the best error-recovery assembly now available."

The Institute has also developed a complete interpreter of the language and its programming environment in ultra-portable form (entirely in C language under Unix) that makes it possible to transport it both on microprocessors and on minicomputers. It has also developed innovative methods of portable compilation of application languages (C-language object code generation) that open promising prospects of application to object-language compilation.

Toward a High Degree of Parallelization

All these basic tools will also have to aim at a higher degree of parallelization and a better integration of results concerning the organization of human memories, especially in associative and data-gathering processing. For this, thanks to an industrial collaboration agreement signed with NCR, the Institute will be able to use a new systolic-architecture parallel processor to test future data-gathering models.

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CSO: 3698/616

COMPUTERS

FRG RESEARCH ASSOCIATION FUNDS AT WORK AT KARLSRUHE

Stuttgart VDI NACHRICHTEN in German 12 Apr 85 p 5

[Article: "Artificial Intelligence: New Funds for Progressive Technology--Knowledge Processing Systems Are Among the Most Important Research Areas of the Future"]

[Text] Fundamental research in the FRG is becoming ever more dependent upon outside funds. A source of such outside funds are the "special research areas" to which support is granted by the German Research Association (DFG), with which especially promising front line research is to be promoted. Now at the University of Karlsruhe the "special research area" (SFB) of "artificial intelligence" has been announced to the public.

The artificial intelligence SFB is being funded by the DFG with 11.1 million marks--according to the announcement by the Baden-Wuerttemberg minister for science and art, Prof Dr Helmut Engler, on the occasion of the presentation of the SFB on 18 March in Karlsruhe. Of this, the University of Karlsruhe is receiving 5.3 million marks. The rest is being distributed over the computer science specialties at the Universities of Kaiserlautern and Saarbruecken and the Fraunhofer Institute for Information Processing and Data Processing in Karlsruhe. All these latter institutions are also participating in the SFB. The SFB is expected provisionally to terminate by the end of 1987.

Out of the total sum it will be possible to provide supplementary financing for 33 scientists and 37 student aides. In addition, the DFG is financing especially powerful computers which must be procured from the United States for the research studies in the area of artificial intelligence. To the extent that the basic equipment is not already available it will be supplemented by the participating FRG states--in accordance with recommendations made by an independent commission of scientific experts. The State of Baden-Wuerttemberg has set aside for this purpose for the period 1985 through 1987 about 330,000 marks from the funds contained in its research promotion program.

Prof Dr Peter Deussen, manager of the Institute for Information and spokesman for the special research area, explained that the scientists participating in the SFB have agreed upon the following six research areas:

i. deductive systems: design of systems for the automatic proof of mathematical theorems; systems for symbolic computation;

ii. expert systems: systems which contain knowledge relating to special areas (e.g., parts of medicine, engine construction, computer configuration, planning of production facilities). Via dialogue these systems make knowledge available to the user in response to questions and are capable of carrying out autonomous inferences;

iii. processing of natural language: in particular areas of knowledge it is possible today for computers to understand (written) natural language and to make replies in natural language while using expert systems;

iv. picture interpretation: the identification of specific objects in pictures as well as the description of their mutual relationships (e.g., automatic counting of blood pictures, detection of objects by robots);

v. robotics: guidance of autonomous robots (possessing two arms) on the basis of measurements of the environment surrounding the robot;

vi. software for artificial intelligence: unification and further development of the special computer languages required for artificial intelligence; development of tools for the design of expert systems.

With regard to the national economic importance of artificial intelligence, Minister Engler drew attention to the worldwide efforts in this area being conducted especially in the United States and in Japan where long-term programs have been supplied with ample funds. He pointed out that in two memoranda the computer science industry and representatives of science and technology in 1983 had called attention to the great need existing in the FRG to catch up in this area. In their "computer science" government report he observed that the FRG in 1984 had responded to these two memoranda and planned the assignment of 200 million marks just for the areas of knowledge processing and pattern recognition in the years 1984 through 1988. He also stated that the German Federal Government and the states had at the same time agreed with one another to make available an additional 100 million marks from the DFG in the same period of time for the promotion of fundamental research in computer science.

Minister Engler also took the occasion of the presentation of the SFB as an opportunity to point out that a successful transfer of university research into industry over the long term could be guaranteed only on the basis of adequate training for students in the area of computer science. Nevertheless, he pointed out that at the present rapid rate of growth in numbers of students commencing studies in the area of computer science this would hardly be possible.

In the opinion of Engler the introduction of a numerus clausus in this situation would be, while undesirable, nevertheless a necessary step wherever feasible. But it is his opinion that at the same time the offered education in computer science should be further expanded.

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CSO: 3698/605

COMPUTERS

BULL INTRODUCES NEW TOP-OF-LINE 32 BIT COMPUTER

Paris ELECTRONIQUE ACTUALITES in French 31 May 85 p 5

[Text] Bull is launching the DPS 6/850, the new top-of-the-line among its 32 bit DPS's.

The system falls between the DPS 6/950 and the DPS 6/750, compared to which it is said to be twice as powerful.

Offered in a single rack, it offers from 2 to 4 MBytes of main memory, controls up to 64 communication lines and from 16 Mbytes to 1 Gbyte of mass memory made up of the same magnetic bases as the rest of the line.

It has, also as standard equipment, a buffer and CIP (Commercial Instruction Processor) and SIP (Scientific Instruction Processor).

It operates under GCOS [General Comprehensive Operating Supervision] 6MOD 400, is completely compatible with the other DPS 6 models and may be upgraded on-site to a DPS 6/950.

The manufacturer is also offering, on the low end, new extensions of the DPS 6/100, its 16 bit entry level system which will now be able to control a 15 Mbyte hard disk and, as standard equipment, Multiplan software.

A basic configuration of this system, including, in particular, a 650 K floppy disk drive and a hard disk, is offered at a price of approximately Fr 82,000.

A basic configuration of the DPS 6/850 with, among other things, 2 Mbytes of main memory, two removable 256 Mbyte disks, a 650 lpm printer and a communications controller costs Fr 1.287 thousand.

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CSO: 3698/ 557

COMPUTERS

PHILIPS MARKETS JAPANESE MICROCOMPUTER

Paris AFP SCIENCES in French 20 Jun 85 p 43

[Article: "Philips: Microcomputers With Japanese Flair"]

[Text] Paris--On 13 June, in Paris, Philips introduced two home computers, one of which is manufactured by the Japanese company Kyocera, and both of which operate under the "MSX" standard adopted by some 20 Japanese firms. The groups hopes to get at least 25 percent of all sales of MSX microcomputers in France, which in 1985 were estimated by Philips at 150,000 units, out of a total of 500,000 home computers.

The MSX standard developed by the U.S. company Microsoft, was adopted by nearly all Japanese electronics company which use it as a battle horse to conquer the home-computer market. Philips is thus the first European company to rally under this standard, which will soon be adopted by Siemens and Olympia.

Philips's decision also put an end to its tentative association with Thomson with a view to working out a joint standard, although at the time the possibility of such an alliance was seen as a test of European manufacturers' determination to fight back the Japanese offensive. "We adhered to the MSX standard and its future modifications, so that our relations with Thomson have been postponed," Mr Patrick Fauquette, in charge of Philips's home computer department, stated.

Of the two machines that will be available next September, only the basic model is manufactured at the Le Mans radiotechnological factory, and it will supply the European market. The more sophisticated model will eventually be produced in France. These MSX models are completing Philips's line, which last October had introduced an entry-level microcomputer--the VG-5,000--only 35,000 units of which were sold in France.

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COMPUTERS

BRIEFS

SUPERCOMPUTER FOR ITALY--The first large-scale computer to be installed in Italy was designed and manufactured by the U.S. company Cray Research Inc. and was inaugurated in Bologna at the headquarters of CINECA [expansion unknown], a consortium of 13 Italian universities, we learned on 20 June. The computer, a Cray X-MP/12, will manage the electronic computing center of Northeast Italy. According to the center director, Prof Remo Rossi, it has multiple uses ranging from theoretical physics to molecular biology, and from oil research to aeronautics. Fewer than 100 computers of that size are operating throughout the world at present. They are all used for research. [Text] [Paris AFP SCIENCES in French 27 Jun 85 p 46] 9294

JOINT EUROPEAN SOFTWARE RESEARCH--Seven European software companies have decided to pool their research efforts to create a program aimed at improving software production control through the use of advanced data-processing tools, one of the partners, SESA [Automation Systems Study Company] indicated on 24 June in Paris. The agreement, which was signed by Siemens (FRG), STC-Technology (Great-Britain), CIT-Alcatel, SESA, CERCI [Industrial Cybernetics Research and Implementation], TECSI [expansion unknown], TRT-Philips (France) and Data-Management (Italy), will lead to the creation of software called SPMMS (Software Production and Maintenance Management Support), more specifically designed for executives, financial analysts and engineers. SPMMS will make possible cost estimates using corporate databases, planning preparation, project control, quality control, software re-use and product management. Cost, expenditure and quality data will be automatically collected and then tapped by the decision-making tools. [Text] [Paris AFP SCIENCES in French 27 Jun 85 p 46] 9294

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FACTORY AUTOMATION

RTM OF ITALY APPLIES POWER LASERS TO WELDING, HARDENING

Paris INDUSTRIES & TECHNIQUES in French 20 Mar 85 pp 35-37

[Article by Andre Larane: "The Master of Lasers of Fiat and Olivetti"]

[Text] The RTM is the only one in Europe to have 5 power lasers, including one with a 15-kW output. All are used to develop processes: sheetmetal welding, spot hardening, etc. Fiat and Olivetti have already taken advantage of it.

Vico Canavese is by no means an industrial suburb. In the Piedmont Alps, it is a village at the end of the world, an intermediate-altitude station, paradisiacal surroundings. This is where you can find the highest laser concentration in Europe! Here, the Institute for Mechanical Technology Research and Automation (RTM) has 5 industrial lasers, ranging from 100 watts to 15 kW. It is carrying out feasibility tests of mechanical-part machining and surface treatment. Its clients include all the big names of the Italian industry, including small or mid-size companies that are not well known on our side of the Alps. In addition to laser research, the Institute develops and produces prototypes of special machines. It carries out metrology and vibrational analysis tests. It also develops the data-processing tools required for its analyses or for the development of computer-aided design and manufacturing systems.

The RTM was created 25 years ago jointly by Olivetti, Fiat and Finmeccanica, which includes, among others, Alfa Romea, SAIMP [expansion unknown] (machine-tools), Aeritalia and Ansaldo (nuclear). It is a non-profit organization that makes its research resources available to the three founding members and several tens of subscribers. The story of its creation is unusual. At his death in 1960, Giacomo Saudino, a majority shareholder of Olivetti, ceded some of his shares to the Vico Canavese municipality. As a counterpart, he demanded that a professional school and a production unit be built. This was done. But five years later, the village mayor decided to rent the industrial building to the Institute, which was looking for a temporary location. And what was meant to be temporary has been lasting to this day. It is true that Ivrea, headquarters of Olivetti, is only 20 km away, at the mouth of the valley. As for Fiat, it is less than 100 km away... Distance is not an insuperable handicap.

Curiously enough, the Institute, where 60 people are working, does not employ any researcher. These are delegated by the founding companies. "This method encourages exchanges and intermixing," the director, Giuseppe Ricciardi, observed. Some researchers are attracted by study grants. In that case, they are hired by one of the founders and immediately placed at the Institute's disposal. Several Fiat machine-tool executives work at the RTM. In Brazil, this is also the case of the president of Romi, the largest machine-tool manufacturer. And even in Italy, most laser experts started at Vico Canavese.

From 1978, when a 15-kW Avco laser was installed at the RTM, until 1983, when the national laser-research program was completed, most of the Institute's activities have been devoted to the development of that technology. In addition to the Avco laser, which is equipped with two work stations for welding and heat treatment, there is a 2.5-kW Spectra Physics dedicated to welding for the automotive industry, a 500-W Coherent for metal cutting, and two 500 and 100-W Valfivre for plastics machining and high-precision micromachining. Valfivre is a laser manufacturer from Florence which is mainly oriented toward the medical market. The five RTM lasers are of the continuous-flow CO_2 type. Apart from the 100-W laser that was loaned by a Turin company for tests, all were purchased.

The Automobile Industry Will Soon Adopt Laser-Welding for Sheetmetal Assembly

Malchi Cantello, head of the Laser Center, has followed development from the start. "For welding, laser guarantees considerable gains," he said. "The automobile industry is now equipping itself for mechanical parts. Very soon, it will adopt laser-welding for sheetmetal assembly."

At Fiat, an RTM study has already led to the introduction of four 2.5-kW lasers for production. These instruments are used to weld synchronizers and their gears. The work stations were robotized by Comau, a Fiat subsidiary specialized in equipment manufacturing. Before that, the automobile manufacturer used brazing. The operation lasted several hours and caused some part distortion. With a laser, it is possible to make 2-mm thick welds at the rate of 5 m per minute, and with no distortion. Together with Alfa Romeo, the Institute is developing stellite deposition on valve seats. The advantage of laser is that it does not damage the seat material, a mild steel, with the deposit, a hard cobalt alloy. The operation lasts only a very short time and the beam temperature is very high, so that the alloy diffusion zone remains limited. After it has been deposited on the valve seat, the stellite must be machined by traditional means. The part is then finished.

Household appliance manufacturers are also interested in the resources of laser welding. Zanussi and the RTM are test-welding a bearing on its support, using a 2.5-kW laser. The operation must not generate any deformation. Laser welding finds an original application in heat exchangers. The RTM is trying to weld the heat-exchanger blades directly onto the shaft. The beam offers the advantage that it can pass between two blades, in a 20-mm corridor. It is thus possible to assemble all the blades on their support before welding them. With traditional welding, the blades must be assembled and welded one by one.

Pending the adoption of laser-beam sheetmetal welding by the automobile industry, which should provide constant quality and improved strength, the Center is studying the needs of the nuclear industry. In the (uncertain) event that the Superphenix II reactor is built at Creys-Malville, the Center has developed a candle-welding method using the 15-kW laser. The candle, 1,200 of which are to be made for the breeder reactor, must not be subjected to deformations exceeding 0.1 mm over a 1,200-mm length. It is shaped like a hollow cylinder, with a very intricate profile. If they decide to make it in a single piece, machining the inner parts will become nearly impossible. If they adopt the principle of a three-part assembly--two tubes connected to the central part by 15-mm thick welds--deformation-related tolerances will impose the use of laser welding. "Laser-welding of candles has now been approved," Malchi Cantello indicated. "All we have to do, is to wait for the construction of Superphenix II, in two years from now."

Heat treatment is the RTM's other favorite application field. "It requires a low-concentration beam, 10^3-10^4 W/cm^2 instead of 10^7-10^8 W/cm^2 for welding or cutting," the head of the Laser Center explained. "Heating is very fast, up to 1300°C in one half second. Cooling is also very fast." But the maximum thickness that can be treated does not exceed 1 or 2 mm. Above that, cooling by mere conduction is no longer fast enough; now, the advantage of laser is that it does not require any external coolant. The RTM has thus treated camshafts, on very small areas at the junction of the shaft and the cams. The treatment of sensitive parts makes it possible to use grey iron instead of special iron for the part.

The RTM is also carrying out more basic studies on laser operation. Together with the Turin Politecnico, it analyzed the plasma that darkens the beam and hinders its action. Using a lateral wind of inert gas, the plasma can be dissipated and, at the same time, metal oxidation prevented. To weld poorly fitted parts, the Center has developed a way of adding metal behind the beam. The wire is dipped into the melting bath and melts immediately. The result is a weld bead that is accurate to 0.5 mm. These results go hand in hand with the design of adaptive controls for laser sources: controls that adjust the beam for any unevenness of the path.

"Laser is not everything, and today we are encouraging the development of our other departments," the director of the RTM indicated. As far as the design of advanced machines is concerned, for instance, the Institute is studying hydrostatic slip. This is applied to chucks and to ball recirculating screws to which it provides maximum speed without any friction. The work-holding table of the 15-kW Avco laser is thus mounted on a hydrostatic slide. "When we design a special machine-tool, we often include production of a prototype, or even three or four units," Giuseppe Ricciardi explained. "We can do that with our tooling workshop, and we thus avoid the problems involved in subcontracting."

The same department contributed to the development of a tool rack for machining centers. The device is mounted on a carriage that can easily be transferred from the tool-adjustment bench to the machine. It is now commercialized by Olivetti and Jobs.

Preliminary Theoretical Analyses

The metrology department is becoming increasingly important, due to the new demands of machine-tool manufacturers. They use vibrational analysis to design machine structures. To test gear boxes for the automobile industry, the RTM has developed a machine that analyses acoustic signatures. These machines use structural calculus. We are then entering the operational field of the applied data-processing department; a department that is interested in machine modeling as well as in workshop simulations. "Recent progress in the automobile industry owes much to preliminary theoretical analysis," Giuseppe Ricciardi pointed out. "Thus, the Uno car could be produced at a fast rate as soon as it was introduced. Before that, they used to wait a few months after the introduction of a model at the Automobile Show before going to full production rate. They needed the time to correct initial defects."

RTM

With 60 employees and researchers, the Institute for Mechanical Technology Research and Automation (RTM) achieved 1983 sales of 2.5 billion lire, i.e. 12 million French francs. It has several functions: applied research on behalf of the three founding companies, technical assistance for its subscribers, i.e. small and mid-size industries, basic research in collaboration with the Italian National Research Center (the equivalent of our National Center for Scientific Research), and training.

About 10 study grants are awarded each year to academics. Jointly with the National Research Center, the Institute participated in a laser project (completed in 1983). Right after that, it started a five-year project dedicated to mechanical technologies, the goal being to design a flexible workshop.

All RTM activities have one thing in common: R&D on machine tools and mechanics automation. These activities are organized around four departments: technology (laser center and advanced technologies), advanced-machine design and manufacturing, metrology, and applied data processing.

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FACTORY AUTOMATION

BRIEFS

ITALIAN AUTOMATED FACTORY PLAN--Milan (vwd). The first fully automated factory is about to arise in Italy. This is the goal of a 5-year development plan on the part of the National Italian Research Council (CNR) which at the present time is in preparation and is expected to start by the middle of 1986. The aim of the plan is the robotizing of all planning, production and control processes. In the domain of factory robots Italy is already among the leading industrial countries and intends to retain this position also in the future according to the chairman of the Studies Commission for the State Robotizing Plan, Marco Somalvico. The first assembly robot in the world was developed by the DEA Company in Moncalieri near Turin. It was sold 2 years ago by the founders of the nationalized company Elsag. Of the five assembly robots which exist today internationally two are Italian developments: DEA's Pragma and Olivetti's Sigma. At the present time the most modern and the most heavily robotized factory is FIAT's engine plant in Termoli where the single-liter engine "Fire 1000" is being built by 97 robots controlled through 102 computers. [Text] [Frankfurt/Main FRANKFURTER ZEITUNG/BLICK DURCH DIE WIRTSCHAFT in German 4 Jul 85 p 7] 8008

CSO: 3698/604

MICROELECTRONICS

STATUS OF MICROELECTRONICS PLAN IN AUSTRIA

Munich COMPUTERWOCHE in German 12 Apr 85 p 128

[Article: "Only Six Applications Meet the Conditions: Small Businesses Have Problems With Funding"]

[Text] Vienna (apa). The new funding program for innovations in the area of microelectronics is confronting small and middle-sized companies with bigger formal problems than those encountered by large enterprises. Although about 200 companies have expressed interest in the funding which is limited to 10 million schillings per firm annually up to the present there have been only 6 applications which meet the required criteria.

In addition, there are another 15 "incomplete" applications, according to Dr Hermann Bodenseher, manager of the information processing division in the Ministry of Science. It is the small enterprises in particular which appear to be making excessive claims in filling out the contract, said Bodenseher. The contract form was designed to match the form used in applying for ERP credits. Large enterprises, according to Dr Bodenseher, have had more practical experience with this process. But he said that this development had been expected and that soon the smaller enterprises, too, will be availing themselves of microelectronics funding in large numbers. He stated that it was to be expected that the funding volume of 250 million schillings for 1985 would be fully exhausted.

The "valid" proposals which have thus far been submitted relate to semiconductor technology, microprocessors, communications engineering and robotics engineering. The projects involve investment volumes between 1.6 million schillings and 100 million schillings. The practice, tried in the past, of having banks apply for funding in order to be able to offer their customers favorable financing terms is not being accepted, Bodenseher added.

The microelectronics funding program was established by the German Federal Government for the years 1985 through 1987. For each of the 3 years the funding amounts to 250 million schillings. Support is being given not only to investments in physical plant but also to nonmaterial projects such as software development, training and marketing. The scientific evaluation of the applications lies within the scope of the Ministry of Science; the industrial and national economic evaluation is being handled by the Ministry for Public Industry and Transport.

Bodenseher emphasized the importance of microelectronics for the structure of Austrian industry. For Austria possesses a high potential in terms of knowledge which must be put into application if the traditional "smokestack industries" are to be replaced by modern, environmentally friendly manufactures. The funding program, according to Dr Bodenseher, is being administered by a minimum of personnel. Each employee with a job contract has been hired at one and the same time in both ministries concerned.

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MICROELECTRONICS

FRANCE'S LETI PREPARES TO PRODUCE 4 MBIT BUBBLE MEMORY

Paris ELECTRONIQUE ACTUALITES in French 14 Jun 85 pp 1,20

[Text] LETI has perfected its 4 Mbit bubble memory technology. This is mixed technology drawing on an advanced ionic implantation technique for producing loops and on a more conventional Permalloy technique for output interfaces.

However, it is not certain that Sagem will pick up this technology as is for the 4 Mbit memories that the company is supposed to test during the first half of 1986: Sagem is, in fact, absolutely required to produce a Motorola-compatible product and that company has not yet established its technology for the 4 Mbit generation.

LETI, which is doing advance work for Sagem in this field, should be ready to transfer its technology at the end of 1985 in the form of a 1 Mbit circuit which, if its technology were adopted, would immediately be expanded to 4 Mbits by Sagem.

No More Than 1 cm^2 of Chip Surface

As orientation for its technological choices on the 4 Mbit level, LETI set two technical criteria:

-not to exceed a chip surface of 1 cm^2 because of cost problems;

-not to move into submicro technology in order to facilitate a rapid industrialization.

These two contradictory criteria led to consideration of a new, more dense technique: until now, to obtain the vertical field gradient necessary for the operation of bubble memories, a level field with magnetizable metallic patterns placed on the surface of the chip was used: the level field magnetized these patterns (usually made of Permalloy or another nickel-iron alloy) and created poles which either attracted or repelled the bubbles. With the new technique finally adopted by LETI for production of the storage loops of its memories, the vertical field gradient is still obtained by applying a level field with patterns, but these patterns are produced by means of ionic implantation of ions in the magnetic film itself.

According to LETI, this process has two advantages: on the one hand, it allows integration of the driving force of the bubbles into the magnetic layer; on the other hand, the lithographic precision of a given pattern can be less (with identical lithographic precision, it is thus possible to utilize smaller patterns), since here the bubbles move around the nonimplanted patterns.

In practice, LETI has produced loops with a footprint of 4 microns with bubbles of 1 micron using this technology. Unfortunately, at the present level of development of the technique, ionic implantation does not lend itself very well to the creation of transfer ports and primary loops; only new integrated command circuits might be able to salvage the implantation solution using a single technology. However, this solution is excluded in practice: the 4 Mbit memories must behave like the 1 Mbit memories for the command circuits; compatibility is obligatory.

LETI was thus led to the use of dual technology: ionic implantation for the memory loops and Permalloy for the interfaces. The latter technology is quite conventional, but it has only a limited application here and does not constitute a very large part of the surface of the final chip.

Dual technology is unfortunately always more expensive than simple technology: it necessitates three levels of critical masking instead of two It has been operational since early 1985 at LETI.

Politics Before Technology

As mentioned, it is not certain that Sagem will put this technology into practice, on the one hand, because of a compatibility problem with Motorola; and, on the other hand, because of a commercial efficiency problem. In principle, the dual technology is the best and Motorola ought to adopt it also. Unfortunately, we have good reason to believe that the American military is putting pressure on Motorola to deliver Intel compatibility. But this has Permalloy technology with a 2 cm^2 chip! To be continued...

Where is the 4 Mbit competition? Hitachi is testing a 2 cm^2 chip model with Permalloy technology (6-micron footprint, 1.5-micron bubbles); like LETI, the company is working on hybrid technology, but no sample has been furnished yet.

Fujitsu is using a technique with very dense "bean" patterns (4-micron footprint, 0.8- to 0.9-micron bubbles) but which is rather susceptible to small defects; testing is still in progress, but users have had a few minor problems.

As mentioned, Intel is in the preproduction stage with conventional technology after having abandoned its fine lithography process.

The switch from 4 Mbits to 16 Mbits should not be too difficult for LETI: use of photorepeaters or deep ultraviolet machines for lithography should allow the change to 0.6- to 0.7-micron bubbles suitable for the 16 Mbit level. In principal, the transfer of this technology to Sagem is supposed to be made at the end of 1988. After that 0.3-micron bubbles are foreseen, which could constitute a physical limit which might prove to be temporary.

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MICROELECTRONICS

THOMSON SC TO INVEST IN NEW PRODUCTION FACILITY

Paris ELECTRONIQUE ACTUALITES in French 21 Jun 85 p 17

[Text] Thomson Semiconductors has just decided to launch a significant program of investment in discrete semiconductors, which will take the form of a new factory, entirely equipped for state of the art technologies, particularly in planar high voltage bipolar technology and high power MOS technology. This investment will not be implemented on the site of the Aix-en-Province facility, currently responsible for all moderate voltage diodes and transistors, since that facility has no room to expand. The site decision for the installation should be made before the end of the year.

This unit, already dubbed "Discrete III" within the company (the other two being at Aix-en-Province and Tours), will represent an initial investment of Fr 450 thousand. Ultimately, all Aix activities are to be transferred there, since the cost of retooling current production at Aix would probably be Fr 800 thousand.

According to Mr Dutheil, recently named director of the discrete semiconductor division, "Discrete III" should become operational in mid-1987. Its initial capacity will be 18,000 6-inch wafers per month. But discrete semiconductors are more than just the object of investment: R and D teams are also to be doubled between now and the end of 1986 with the result that, during the 1986-87 period, the R and D share of the company's revenue will exceed 10 percent (the norm in discrete semiconductors is on the order of & percent).

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MICROELECTRONICS

BRIEFS

FRG MICROELECTRONICS PROGRAM--From 1982 to 1984, a total of 2,430 projects of 1,740 firms have been supported by the special "Microelectronics Applications" program. The program represents the first "indirect-specific" support measure of the federal Ministry of Research. In 75 percent of the cases, enterprises applied for funds in the amount of less than DM 300,000 each. Six percent of the applicants made use of the DM 800,000 maximum support provided by the program. DM 450 million were available for the research program. [Text] [Frankfurt/Main FRANKFURTER ALLGEMEINE ZEITUNG in German 19 Jun 85 p 31] 12666

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SCIENTIFIC AND INDUSTRIAL POLICY

FRENCH FOREIGN MINISTER SUMMARIZES EUREKA PROGRESS

Paris AFP SCIENCES in French 27 Jun 85 pp 1a-2

[Unsigned article]

[Text] The European summit meeting in Milan on 28 and 29 June will "take note of the positive reception" from countries which have been contacted--within "and even beyond" the European Community (EEC)--by the Eureka project for European high technology, declared on 26 June Roland Dumas, French foreign relations minister.

At the conclusion of the Council of Ministers meeting, Mr Dumas indicated that the reception given to this French project had been "extremely favorable," not only among EEC partners, including Spain and Portugal, but also among "countries outside the EEC, which had been visited by the delegation led by ambassador Claude Arnaud."

The minister pointed out that this involves four countries at first, Sweden, Norway, Austria, and Switzerland, but "even beyond Europe, some countries such as Japan have shown interest, or at least curiosity."

"Among the Eastern European countries," the minister added, Bulgaria and the USSR are also asking us about Eureka, meaning that the reception has been very favorable."

Mr Dumas pointed out that his department had addressed "a letter to each of the countries visited, to thank them for their welcome, note the positive response, and invite them to pursue the implementation of Eureka's second phase."

In parallel with the exploratory contacts with various countries, Mr Dumas continued, the first phase of Eureka, "which ends with the Milan summit meeting," was characterized by the formulation of programs in which both industries and states will participate.

The minister cited some first examples, such as an agreement between Matra and the Norwegian company Norsk-Data for compact vector computers, and another, joint agreement between four of the large European electronic companies, GEC (Great-Britain), Siemens (FRG), Thomson (FRG [as published]), and Philips (Netherlands).

The minister indicated that "other programs are under discussion" between France and the Netherlands, as well as France and Italy, "for everything involving information technology, lasers, and automation." Negotiations are also being carried out in high technology research for oceanography and agricultural food products.

The Milan summit meeting will ultimately lead to a "consideration of Eureka's future, its structures, and its organization," proposals which have been advanced by France in a memorandum addressed to its partners.

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SCIENTIFIC AND INDUSTRIAL POLICY

FRANCE, FRG AGREE ON DEFINITION OF EUREKA

Paris AFP SCIENCES in French 27 Jun 85 pp 2-4

[Unsigned article]

[Text] Bonn--On 26 June in Bonn, France and FRG have agreed on a joint definition of the European technologic cooperation project Eureka, which will be presented on the 28th at the European summit meeting in Milan, and which according to official sources will include three types of actions.

The research ministers of the two countries, Hubert Curien and Heinz Reisenhuber, as well as the foreign affairs ministers, Roland Dumas and Hans-Dietrich Genscher, "are determined to implement Eureka," announced a West German foreign affairs spokesman in press release.

"We realized that we have exactly the same definition of the project," also declared Mr Curien to AFP. "We realized that for the program details we have every intention of moving in the same direction."

The three areas of action selected by the two countries are:

1) Technical programs oriented toward the needs of the market, such as very diversified information technology instruments;

2) Technical programs oriented toward the solution of common problems, such as environment and toxicology, which are not oriented directly toward the fabrication of goods, but which can be solved only by very advanced research;

3) Technology oriented toward the large infrastructures under the jurisdiction of the state: rapid transportation, new telecommunication systems.

According to Mr Curien, the two countries have reaffirmed their will to apply at the same time and in collaboration, the two following principles: variable geometry and global compensation. "Variable geometry," the minister specified, "means that those who are directly interested, and not necessarily everyone, participates in each of the programs. Global compensation means that all the European countries, all the European industries, can be involved in all the programs as a whole."

Eureka Initiated by Paris and Bonn

France and FRG have thus initiated the Eureka project, an attempted European response to the challenge of American and Japanese high technology. The foreign affairs and research ministers of the two countries, meeting in Bonn, have however adopted only the principle. They have stated their "wish to implement it" and have issued a first definition by establishing three areas of action which they hope to have ratified by their eight EEC partners at the Milan summit meeting.

Given the leading role played by Paris and Bonn in the Common Market, and the favorable reception already stated in the eight other capitals, Eureka has a very good chance of being adopted in Milan in this form, but the project remains to be placed in a concrete form, and that is where the skeptics can still make themselves heard.

The three-point definition adopted by Paris and Bonn remains very general. It involves the development of technologies "oriented toward the needs of the market," notably information technology, difficult technologies for eliminating industrial waste, and technologies oriented toward large national infrastructures (rapid transportation, telecommunications).

These formulas appear to be still vague, especially after high level experts in the two countries have communicated to the press very concrete examples of future applications such as optronics, new materials, large computers, power lasers, particle beams, artificial intelligence, and very fast microelectronics.

In addition to the need to prove that the three-point French-German program will become a technologic answer to IDS (Strategic Defense Initiative), the Europeans still have to define in Milan of afterwards, the ways and means of their cooperation, the coordination structure for their work, and the financial resources for carrying it out; in other words, all its essential aspects.

Lastly, if Eureka is conceived as a technologic response to IDS, the Europeans also have to provide a military answer to the extent to which IDS creates a risk of detaching Western Europe from the United States. The French and West German defense ministers, Charles Hernu and Manfred Woerner, did discuss IDS for more than three hours in Bonn following the meetings of the research ministers. But planning in this area could take years.

Two days before this meeting, Chancellor Helmut Kohl declared during a gathering of his Christian-Democratic parliamentary group, that FRG did not have to choose between Eureka and IDS.

It is not a matter, Mr Kohl pointed out, of choosing "one or the other" of these projects, but rather to be interested "as much in one as in the other." "FRG needs the United States for its security, and it needs France to promote the integration of Europe," he explained.

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SCIENTIFIC AND INDUSTRIAL POLICY

PRELIMINARY SKETCH OF EUREKA EXECUTIVE MECHANISM

Paris AFP SCIENCES in French 20 Jun 85 p 1

[Unsigned article]

[Text] Brussels--A source close to the European Commission in Brussels indicated on 18 June that the Commission will ask the directors of the EEC for a vigorous effort on behalf of technologic research in the organization, in order to maintain the competitiveness of European enterprises against Japan and the United States.

The draft of the executive organ of the EEC, whose details will be submitted to the heads of state and government of the ten countries on 28 and 29 June in Milan, covers the essential features of the French proposal for European technology, Eureka, lending it an EEC orientation, added the same source. This project, according to the source, has no direct connection with the American Strategic Defense Initiative (IDS), endowed with $26 billion over five years to finance research on an anti-missile "space shield."

However, in order to avoid a brain-drain towards the United States and to prevent the occurrence of a technology gap, the EEC executives deem it urgent to mobilize the European potential so that the organization's enterprises will not be reduced to the role of subcontractors.

It is felt within EEC circles, that the Eureka project, started last April, is finding growing support in the Community, notably from FRG, Great-Britain, and Italy. Financing would be provided by the EEC budget, enterprises, and governments. At the same time, the Commission offers to carry research expenses (currently about $500 million per year) at 3-6 percent as part of the EEC budget.

The Commission's experts estimate that the first projects could be launched before the end of the year, with the Milan summit meeting providing them with a green light in principle. The research areas are the same as those proposed by Paris for Eureka, with particular emphasis on telecommunications, indicates a source close to the Commission.

On 20 June, Mr Delors confirmed to a commission of the European parliament, the creation of a European technology community, and defended the need for joint planning of technical research in the EEC. But, he added, this common viewpoint must be reconciled with a pragmatic approach for the immediate launching of a few projects.

The European technology community must depend on a "variable geometry" Europe. The projects, he added, must be capable of being launched within or outside the EEC, by all 12 European countries or only by some of them, and of forming associations with countries outside the community. An evaluation office should monitor each project for annual progress determinations. "Our proposal is not maximalist," added the chairman of the EEC. "We want to bring some project to the table with a comprehensive point of view."

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SCIENTIFIC AND INDUSTRIAL POLICY

EUROPEAN COMPANIES FAVOR PARTICIPATION IN EUREKA

Paris AFP SCIENCES in French 20 Jun 85 p 5

[Unsigned article]

[Text] Brussels--European companies must not miss any opportunity to participate in technical research programs, whether they involve the American Strategic Defense Initiative (IDS) or the European project Eureka, stated Volvo's CEO, Pehr Gyllenhammar on 14 June in Brussels.

"We know IDS's projects, but we know Eureka less," he declared at the end of a meeting between leaders of the European industry, gathered as Round Table group, and the chairman of the European Commission, Jacques Delors.

Mr Gyllenhammar indicated that the enterprises represented within the group are urging the European industry to become interested in two projects, independently of differences of opinion between EEC countries on the timeliness of a European participation in IDS.

Mr Delors in turn, argued for the need to provide a framework for European technologic cooperation, which would not be a bureaucratic one, but would allow negotiations with Washington about civilian technologic cooperation.

"I am afraid that the United States will come into the European supermarket, find the research projects which interests it, buy them, and let Europe once more be the fall guy," he indicated.

Mr Delors acknowledged that no one can prevent European enterprises from accepting the "seductive offers" of the United States and interest-free capital for the research they want to perform. Without a sufficiently large injection of funds from the EEC, the technologic development projects "will not achieve an operational level," he stated.

The Eureka project is credible because its initiators "are planning three or four concrete and feasible projects in agreement with the administrations or enterprises involved," he pointed out.

The Round Table, a discussion group created in 1983, consists of the leaders of several large European companies, among which Renault, Matra, Lafarge-Coppee, and BSN.

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SCIENTIFIC AND INDUSTRIAL POLICY

NETHERLANDS COMMENTARY ON EUREKA MEETING IN PARIS

Rotterdam NRC HANDELSBLAD in Dutch 17 Jul 85 Supplement p 1

[Report by Wubbo Tempel: "EUREKA Unites European Ministers; Cooperation, but Not at Any Price"]

[Text] At the invitation of the French government, ministers of foreign affairs, economic affairs and technology from 17 European countries met today in Paris to lay the foundation for the Eureka program. The goal of this French initiative is to bring Europe up to a technological par with the United States and Japan. Recently, grand statements have revealed that the will exists. Agreement as to the way will require some discussion yet.

Since the French Minister of Foreign Affairs Dumas uttered the word EUREKA for the first time less than 3 months ago, the idea has rapidly become very popular, after initial doubts by other European countries. Two weeks ago the European summit in Milan pronounced its support for the initiative, actually without much discussion on the content. In the meantime a number of countries outside of the EC have also declared their approval.

Thus the will is there, in principle. But that is not enough, for the means also are important. For that purpose, ministers of foreign affairs, economic affairs and technology from 17 countries will meet in Paris today and tomorrow, invited by the French Government and joined in an "ad hoc committee" for the occasion. Besides the 10 EC countries, also attending are Spain and Portugal, delegations from Switzerland, Austria, Sweden, Norway and Finland (which had its registration accepted only after some French hesitation because of its strong ties with the East bloc). Representing the Netherlands at the conference are Minister of Economic Affairs Aardenne and Minister of Education and Science Deetman.

Third Revolution

The reason for the meeting and for Dumas' initiative is the fear that Europe will get behind in the technological area. Or, as the European Commission puts it in a document on the technological renewal of Europe: "Europe launched the first and second industrial revolution. Will it miss the third one now?" The fear, which has been expressed more often during the past years, once again flared up because of the gigantic amount ($26 billion) which

the American Government wants to spend on its Strategic Defense Initiative (SDI) for a space defense system against Soviet missiles. They are actually military matters, but the effect on the civilian industry could be significant.

Especially the fear that whatever technological progress has been made in Europe would be annexed by the SDI program and bartered away to the United States in a "brain drain," made the time ripe for a European initiative. Dumas understood that, and thus he came with his idea, contained in a letter of just three pages.

Cooperation in Europe in the area of technology is not new, for that matter. Until about 4 years ago, however, it took place mainly in the joint research centers of the European Community. The work was strongly directed toward energy and environment and was of a rather fundamental nature, according to Dr W. Enterman of the EC liaison bureau (his office mediates between Dutch companies and EC grantors of subsidies.) The last 4 years there has been much more enthusiasm for involving industry in the cooperation as well, especially after the energetic work of the former EC commissioner for industry Davignon. The basic premise here is that joint research in institutions is important, but that industry has to reap the commercial fruits.

One and the other lead to programs such as ESPRIT [European Strategic Program for Research and Development in Information Technology] to develop European information technology further. During the coming 5 years 3.75 billion guilders will be spent on ESPRIT. Meanwhile 104 projects have already been started, with an average of 5 companies or institutions per project. Other initiatives are, for example, BRITE (processing, application and utilization of new materials) which officially starts at the end of this month and receives 150 million guilders per year, and RACE [Research and Development in Advanced Communications Technologies for Europe] (still at a research stage, with initial costs of 100 million guilders) which is laying the foundation for a large telecommunications network.

With respect to the EUREKA plan, two things are new in comparison with previous initiatives. First the political enthusiasm--the discussion around ESPRIT, the last large European "baby" in the technological area, had definitely been dragging. Moreover, the plans go further than what so far has been achieved jointly in Europe in the industrial area. ESPRIT, and all other programs, limit themselves to so-called pre-competitive research. Industries work together, all right, but only as long as no direct applications are envisaged.

That must be different in EUREKA: cooperation must continue until the bitter end, as it were, until a joint offer is made of a product. So far, there are only examples in the non-EC sphere: the Airbus consortium, in which five large European airplane builders cooperate, and the European space agency ESA, with 11 participating countries.

Competitive cooperation is returning in most ideas concerning EUREKA. But there are also important questions which could seriously disturb the unanimity. The discussion on that can be summarized in three questions: the

content which must be given to the specific projects, the form in which the entire EUREKA initiative must be molded and, finally, where does the money come from, and how much?

Since agreement must still be reached on those types of questions, it is obvious that it will not yet be decided at the conference in Paris when researchers and industry will really get to work. That is not the goal of the meeting either. On this occasion, the French Government only wants to lay the /assises/, the foundations for EUREKA.

Two reports

For example, a discord could possibly arise already over the fact that not one, but two hefty reports will be brought up for discussion at the meeting. Both go back to recent history. The plan which is not that of the French Government bears the title "To a European Technological Community" and was drawn up by the European Commission. In preparing the summit in Milan, the latter wanted to show that thought is given to these matters also in Brussels, and en passant it wanted to steal a little thunder from the French initiative. The other plan is even less modest and bears the title "The Technological Renaissance of Europe." The author is the Centre d'Etudes des Systemes et des Technologies Avancees (CESTA) [Research Center for Advanced Systems and Technologies], a type of management for technological policy at the French Ministry of Industry and Research.

Although the French and EC officials say that they don't contradict each other, there is a great difference in the plans with respect to approach. The French want everything done quickly and therefore they propose a list of 24 specific projects. Those are divided over five areas: computer technology, telecommunications, robotics (with some attention to lasers), biotechnology and materials.

Target Dates

For the completion of the projects, target dates are always mentioned (for example: a supercomputer in 1992, a computer with a so-called parallel architecture likewise in 1992). Each project has a list of potential participants, among which there is a conspicuous large number of French companies. Further, the French no longer mention the big European traffic projects, such as the big highway, the superfast train and the Channel tunnel, which always used to be included in the plans.

Compared to those, the Commission's proposals are much broader. If the French proposal can be seen as a /demand-pull/ approach (you see what the market needs and then you make it), the EC also adds /technology push/: stimulation of technologies of which it is sure that they will be applied at some future date.

The EC list is, moreover, much more extensive. For example, in addition to the French preferences, superconductors and ceramic materials are also given a place, and furthermore there is space research, deep sea research, and education technology. Finally the EC also reserves a place for large

scientific instruments, with the Cern particle accelerator being mentioned, for example. The Dutch delegation officially takes the standpoint that an "integration" must be achieved between the two plans, but it emphatically declares itself for the broader approach.

EC Bureaucracy

A second point of discussion is the form. Although everyone uses the word "flexible" to indicate that not everything has to go by way of the EC bureaucracy (even the Commission itself does not want that), subsequently there are some very different views after all. The French are opposed to EC structures and are even opposed to an agency operating independently of the EC (although the term EUREKA originally was arrived at as an abbreviation for "European Research Coordination Agency"), but they want to leave the initiative entirely up to industry. The EC on the other hand does opt for its own structure, for "after all, it is there for a reason" as one official puts it. Here too, the Netherlands is in the EC camp: the European Commission must have a key role, the Netherlands thinks.

In the EC a subtle distinction is made between "a la carte" and "geometrie variable." The first is undesirable because then something is initiated in which everyone can do whatever he wants, and thus cliques of large countries or companies can exclude small ones.

/Geometrie variable/ is modeled after the ESA structure: everyone participates with a certain basic contribution and subsequently, with additional money, can effectively participate in the various projects. Although the discussion might still lead to unpleasant contrasts, the French Ambassador in the Netherlands, Gaulthier de la Ferriere, cheerfully quotes an observation of the French 19th century physiologist Claude Bernard: "La fonction cree l'organe" [function creates the organ], with which he meant that when something had to happen in the human body, for example, an organ would originate for that purpose by itself.

Finally there is the money matter, on which not many results may be expected from today's meeting. Unofficially, amounts varying from 10 to 20 billion guilders have already been mentioned for the total program. Officially it is only known that European Commission Chairman Narjes (and previously Commission Chairman Delors) have suggested increasing EC expenditures for research and development from 3 percent (almost one billion ECU) to 6 to 8 percent.

British Prime Minister Thatcher has already announced that she thinks the current budget can be spent more efficiently, so that no additional funds are needed.

Companies

Especially in France, considerable attention has been given to companies which showed enthusiasm already in advance. Thereby, French companies were continually mentioned as partners: the electronics company Matra, together with the Norwegian company Norsk Data, will make a new generation of medium-sized scientific computers. Bull and Siemens will concentrate on large

computers. Aerospatiale and the West German Messerschmitt-Bolkow-Blohm have announced, also specifically in the EUREKA context, that they will expand their joint aeronautical know-how.

These initiatives are not really surprising because they link up with older cooperation ties, because the French companies are very close to the government and, moreover, because they have a strong tie with Minister of Science and Technology Curien, who is a former top man of Airbus and of the French institute for space research CNES.

Therefore the initiative of Philips, Siemens, the French Thomson and the British General Electric Company (GEC) seem to be of more significance. Those companies have offered to make a (share) plan for EUREKA within 6 months, if they will receive at least 1 billion ECU (2.5 billion guilders) for that purpose.

That demand for money might possibly be seen as blackmail by outsiders, but Philips itself does not see it that way at all: "Then we would be doing different things from what we would plan to do ourselves," says a spokesman, "and obviously something has to be offered in return." Cooperation has its price. That will also be obvious again in Paris.

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SCIENTIFIC AND INDUSTRIAL POLICY

EUROPE'S FOUR LARGEST ELECTRONICS FIRMS IN EUREKA

Paris AFP SCIENCES in French 27 Jun 85 p 5

[Unsigned article]

[Text] Thomson has announced that Europe's four largest electronics companies, GEC (Great-Britain), Philips (Netherlands), Siemens (FRG), and Thomson (France), have agreed to collaborate on various projects as part of the EUREKA program.

These four companies, states the announcement published on 26 June, have met during the month of June and have agreed on a "declaration of joint intent." Thomson thus confirms the information sent to the British press by GEC.

This agreement could be used to develop "strategic components" such as advanced microprocessors (Europrocesseur), gallium arsenide integrated circuits, microwave components, high density memories, flat screen displays, and sensors of all kinds.

Thomson, observers point out, was recently approached by the Americans for its expertise in gallium arsenide circuits, which interest them as part of the Strategic Defense Initiative (IDS). This agreement would thus be Thomson's "European answer" to IDS.

These various techniques, notes the announcement, serve as the basis for collection, data processing, and complex decision making systems, such as air and ground traffic control, space surveillance from space, production automation, and the television of the future. According to the four companies, these are in fact the types of projects for which the EUREKA program must mobilize the European research potential in order to encourage the development of equipment and systems capable of finding commercial outlets and both civilian and military applications.

These companies, which according to the announcement are "the leaders in research and development, consider that the EUREKA program can become an essential element that will allow Europe to meet the technologic challenge, notably from the work carried out by other nations in advanced electronics."

The joint announcement stresses the desire of these companies to draw into the projects they might pursue jointly, other national manufacturers and research centers. It also points out the synergy that must arise between EUREKA and other projects such as ESPRIT, RACE, and BRITE, as well as the need for a common desire on the part of the governments and companies involved, to make available the necessary resources as part of a sustained program. The companies, the announcement concludes, have agreed to examine the various aspects of the cooperation planned on these projects, during the six months following a decision by the governments to start EUREKA.

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CSO: 3698/565

SCIENTIFIC AND INDUSTRIAL POLICY

DANES PROPOSE TWELVE PROJECTS FOR EUREKA

Copenhagen BERLINGSKE TIDENDE in Danish 19 Jul 85 Section III p 3

[Article by Kermit Norlund: "Here are the Danish Eureka Projects: Ten businesses and the Danish Technical College were Denmark's concrete offer to the inter-European research program"]

[Text] Ten of Denmark's most advanced companies and a research institute have been proposed by the Danish Ministry of Foreign Affairs in a confidential paper as the first group of Eureak participants. BERLINSKE ERHVERV [Business section] can now reveal the nature of the 12 projects which the Danish ministry delegation took along to Paris, where the inter-European research program was started.

De Danske Sukkerfabrikker A/S [The Danish Sugar Manufacturers, Inc.] were proposed in connection with the "Europlants" project, which is intended to use biotechnology to develop crops which combine the best features of existing crops. The project concerns gene manipulation, biochemistry and plant cell technology.

A/S Dansk Gaerings industries was mentioned in connection with the cultivation of plant cells to produce biochemicals for use in the medicine and food industries.

NOVO Industries A/S was proposed as a participant in an effort to develop "designer" proteins with predetermined biochemical characteristics with the help of advanced computer graphics.

Carlsberge Research Laboratories, Biotechnology Division, are to be involved in research pertaining to the industrial applications of high-tech agriculture and animal-raising.

Per Udsen Co. Aircraft Industry A/S was proposed as a partner in projects concerning new materials, both as a producer and as a testing ground for the materials. This company was also mentioned in connection with a fully-automated factory in Eureka's "robot" section.

Ferroperm A/S was mentioned in connection with the development and improvement of ceramic materials.

The Riso laboratory is also to be involved in Eureka research on new materials and on finding ways to improve the properties of existing ones.

NKT Electronics has expressed a strong interest in becoming involved in research on optics systems, particularly with regard to materials research in fiberoptics.

The Electromagnetic Institute of the Danish Technical College (DTH) would like to participate in research on digital fiberoptics, broad band technology and related fields.

CRI A/S proposes the use of "artificial intelligence" systems on a trial basis in the health fields, both with regard to the use of decision-making systems as data bases available to the public, and as education systems in the health sector.

Soren T. Lyngso A/S has been proposed by the Danish government in connection with telecommunications, advanced data processing and industrial computer application/s. The company's expertise in the monitoring and control of large diesel motors and sea-going alarm systems was also touted.

In the paper, which was written in cooperation with the Ministry of Industry, the authors stress that this is only an interim list which should show that Denmark deserves an important role in many Eureka projects. The list is only an offer from the Danish side and by no means includes all of the Danish companies which should be involved in Eureka.

8954
CSO: 3698/595

SCIENTIFIC AND INDUSTRIAL POLICY

BRITE: LIST OF FIRMS, INSTITUTIONS, PROJECTS BY END OF JULY

Paris AFP SCIENCES in French 13 Jun 85 p 5

[Article: "EEC: 'BRITE' RESEARCH PROGRAM TO START THIS SUMMER"]

[Text] Brussels--Before the end of July, the European Commission will prepare a list of EEC research firms and institutions that will receive subsidies under the BRITE (Basic Research on Industrial Technologies for Europe) community research program, we learned on 7 June in Brussels from a source close to the Commission.

The day before, in Helmond (Netherlands), the director of the Dutch company Weld Equipment, Mr H. Vroomans, had announced that his company, which specializes in welding technology, had filed an application under this program as well as Volvo Car Nederland and Philips and some German companies (AEG-Telefunken and Robert Bosch, among others), in the field of metallurgical as well as electronic welding.

The European program is funded with 125 million ECUs [European currenty units] over 4 years (1985/1988), including 65 million ECUs for the first two years; It was adopted by the governments of the 10 member countries on 12 March. It is designed to stimulate cooperation among European firms by subsidizing small industrial projects applying advanced technologies to traditional manufacturing.

As a result of its first call for tenders, the Commission received 566 applications. Each project associates four partners on the average (companies, research laboratories and universities) from all Community countries. The total average cost of a project if 1.5 million ECUs. Those that are selected will be financed for up to 50 percent by the EEC.

Projects involve in particular laser technology, new assembly methods, new materials and new production methods.

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CSO: 3698/568

SCIENTIFIC AND INDUSTRIAL POLICY

FRG RESEARCH NETWORK TO INCREASE ACCESS TO COMPUTERS

Stuttgart BILD DER WISSENSCHAFT in German Apr 1985 pp 76-94

[Article by Uli Deker: "Scientists Move Closer Together: The German Research Network"; scientific consultants: Dipl.-Phys. [Physics Diplomate] Klaus Hoffmann, Fraunhofer Institute of Solid State Technology, Munich; Dr. Wulfdieter Lehmann-Bauerfeld, German Research Network Association, Berlin; Prof. Dr. Roland Ruehle, Institute of Nuclear Energetics and Energy Systems, Stuttgart University; and Prof. Dr. Dieter Ziessow, Ivan Stranski Institute, Berlin Technical University]

[Excerpts] High-performance computers, special graphic output devices, automated experiment equipment, complex program systems: A valuable potential, in a double sense, for scientific work which is distributed in the entire Federal Republic of Germany. With that, it can be used not only on site, but also throughout the Federal Republic; by the end of 1988, the "German Research Network" is to be be built and universities and research institutes connected on a widespread basis. The technical basis is the Federal Postal and Telecommunications Administration Datex-P Network, the rough structure of which is shown in the diagram at left [not reproduced]. The German Research Network is to be used to send programs, data and messages. Scientists in Karlsruhe, for example, should be able to start programs on a supercomputer in Berlin and scientists in Kiel, produce graphics like those shown at right [not reproduced], for which they use the design programs and the special output devices at the University of Stuttgart.

Research without computers is rather the exception today. Biologists, physicians or social scientists use this tool just as physicists and engineers. Not every university, however, has a computer center with all the capabilities.

Super fast computers, for example, which perform more than 100 million additions or multiplications per second, are now available at only the four university computer centers in Berlin, Bochum, Karlsruhe and Stuttgart and at three large research institutes: the Juelich nuclear research installation, the Max Planck Institute for Plasma Physics in Garching and the German Aeronautical and Astronautical Research and Test Institute (DFVLR) in Oberpfaffenhofen.

The same is true for special devices which, for example, can produce expensive color graphics, automatically perform chemical analyses or shape a ship model by computer control for flow experiments.

It would also make no sense to install such expensive systems at all universities since they might not be fully utilized. On the other hand, not just the scientists on site should profit from them. Access by every research laboratory would be ideal.

The German Research Network (DFN) should enable making the resources of devices and programs accessible nationwide to all scientists and thereby improving their utilization.

Three examples of this:

Example 1: Microelectronics. Equipment for designing LSI circuits is available at the Fraunhofer Institute of Solid State Technology (IFT) in Munich.

It is not just a comfortable drawing board for drawing the hundreds of thousands of circuit components which are later to be housed on semiconductor chips the size of a finger nail.

It also checks whether the design rules have been followed, finds elementary erroneous switching such as short circuits and can even simulate by computer the currents which flow in the real chip.

At the end, it generates tapes with control instructions for mask production. The masks are then used as patterns for the actual chip manufacture.

Without such a computer system for VLSI design (VLSI: very large scale integration; 100,000 to 1 million circuit components on one chip), it is hardly possible today to be among the leaders in microelectronics.

Even excluding the programs, such a system, however, costs at least DM 2 million and is therefore beyond the investment capability of a normal university institute. How can smaller institutes share in the hardware, for example, of the IFT [Fraunhofer Institute of Solid State Technology] and the know-how concentrated there?

Through the German Research Network. The German Research Network should enable direct access to such capacities for all interested institutes in the Federal Republic of Germany from their site. They should also be able to transfer their data, run programs on the remote computers and correct errors or make changes by direct interaction.

Example 2: Chemistry. Nuclear spin resonance spectrometers, the measuring principle of which is also the basis of nuclear spin tomography of medical science, enable identification of molecules and their structure. They belong, therefore, to the basic equipment of chemical institutes.

The rapid technical development of superconducting magnets on the one hand and measuring computers on the other today make devices possible with which even the spatial structure of peptides and proteins in solution can be analyzed which is of inestimable importance to biochemistry and biotechnology.

In view of the price of some one million DM, it is understandable that only four of these machines have now been installed in federal German research institutes, one of which is at Frankfurt University.

These high-performance machines are completely controlled by computer. Using the German Research Network, analyses can be performed directly from any institute. Only the sample has to be brought as before to, for example, Frankfurt and prepared for the automatic specimen changer.

The respective scientist is informed in good time through "electronic mail" and then performs the measurements through the German Research Network from his own laboratory. He gets the measurement results for evaluation likewise through the German Research Network and in the process, he can also use the large programs and data banks of other institutes.

At the Ivan Stranski Institute of the Berlin TU [Technical University], such a remote measurement and analysis system is now under development.

Example 3. Power Engineering. High-quality color graphics, synthetically generated by computer, are often thought of as for games. Actually, however, especially large amounts of data can be processed this way so that characteristic features, which might get lost while reading pages of columns of numbers, immediately strike the eye.

The Institute of Nuclear Energetics and Energy Systems (IKE) of Stuttgart University works together with the Karlsruhe Nuclear Research Center to investigate, for example, the processes in the fuel cells and coolant circulation of nuclear reactors.

The expensive experiment equipment required for this is in Karlsruhe; large and fast computers for theoretical simulation as well as special devices for graphics processing of computational or measurement results are in Stuttgart.

Just for this graphics processing, the IKE [Institute of Nuclear Energetics and Energy Systems] has peripherals valued at a quarter million DM. Add to this the special programs which were developed in the institute. Using them would be of interest to scientists in the entire Federal Republic of Germany.

But what might be even more important: Despite spatial separation, the scientists can prepare, perform and analyze experiments together. It would be ideal if they could sit at terminals showing the same images in Stuttgart and Karlsruhe at the same time, and if they could send data back and forth at any time without having to use the slow physical transport of tapes.

Access to local computers and program capacities or even other special equipment throughout the federal republic is the primary idea behind the German Research Network. The secondary goal is to improve communication between scientists.

The current research environment can be compared to an archipelago. Only on occasion do the scientists from the various islands come together: at seminar presentations or congresses. Joint projects are undertaken only seldom and then between institutes that are close to each other. A communication network through which messages, data and programs could be exchanged or jointly used might open chances for stronger cooperation even by scientists widely separated from each other.

The German Research Network intends to provide the following basic services:

--Remote Job Entry: Input and start of programs from any terminal. The programs or jobs are put in a queue at the destination computer, and the queue is worked off step by step. This is primarily intended for programs with very intensive computations which run without further effort and require a special computer unavailable on site.

--Dialog: Access to a computer from any terminal by direct connection. The user converses with a computer to, for example, generate and correct programs or to input, retrieve and process data.

--File Transfer: Transfer of data sets from one computer to another. This may be, for example, measuring results which were obtained on a large device and now have to be analyzed on a special computer, whereby the user, experiment and computer can be located at different sites.

--Computer Based Message Systems: Message systems through a computer and electronic mail. Letters, messages and other information can thereby be sent to other subscribers who can retrieve and process them at a terminal at any time.

These services are the base for building additional applications developed by user groups. An example of this is VLSI design of microelectronic circuits.

At the beginning of 1984, the German Research Network Association was established; the members are the universities, the large federal research institutes, the Max Planck Society, the Fraunhofer Society, the industrial research and development laboratories, computer manufacturers and software houses. A widespread computer network which performs the basic services and facilitates applications of user groups is to be established by 1988.

"Laying cable" comes to mind spontaneously in "establishing a network." But that is not the problem. For the physical connection of subscribers, the data lines of the post office, which are largely already available as cable, are being used.

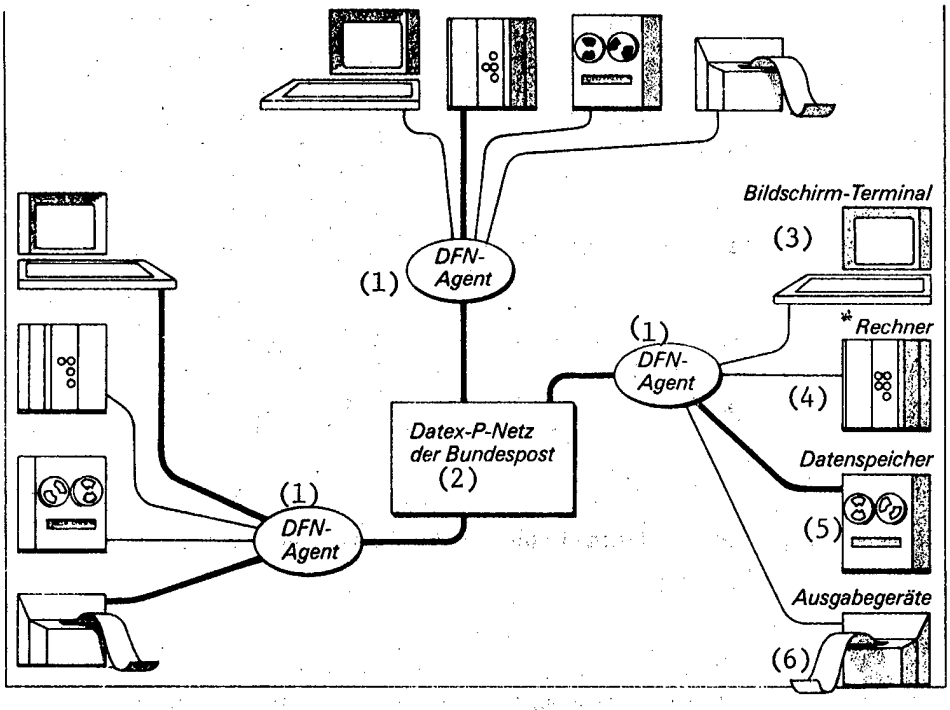

Fig. German Research Network Structure

The entire Federal Republic of Germany is to be fused together into a huge computer center through the German Research Network (DFN). The connection is being provided by the Federal Postal and Telecommunications Administration Datex-P Network. Every computer has access to it through an agent, sort of an interpreter, which, depending on the requirements, is a large computer or just a part of the software. Small machines, for example personal computers, can subscribe as a terminal by telephone through a PAD (Packet Assembly/Disassembly) and an acoustic coupler to the German Research Network.

Key:

1. German Research Network agent
2. Federal Postal and Telecommunications Administration Datex-P Network
3. video display terminal
4. computer
5. data storage
6. output devices

Is it then a question of developing new devices? This too plays a subordinate role: The main product of the German Research Network Association will be programs.

How can one grasp this? A comparison with a familiar communication medium, the telephone, makes the real problem clear: Using a telephone is indeed a simple matter. Still, certain rules have to be followed. This is realized by a person who, for example, wants to make a telephone call from a hotel room. The person must first know what number has to be dialed to access the public network.

The rules for using a telephone are however quite simple. There are two reasons for this:

--Only one type of information is transported through the medium, namely speech, the spoken language. The only information the system needs is the "address" of the other party, the person's telephone number.

--There are people directly on both ends of the line who use a natural type of communication with the language. Tacit agreements between them take care of finding a common language, alternating in talking and listening and so on. If, however, they do not handle this successfully, the telephone call ends without results.

This is precisely the problem when computers or general data devices have to communicate with each other: They must come to an agreement too. But they do not have methods to react flexibly to each other; they are stolidly fixed to their ways of expression and behavior which are specific to the manufacturer.

Every manufacturer has developed its own concept of sol ing this problem; in doing so, the special virtues of its systems are used or a particular solution has been adopted even just by coincidence. For behind a part of the diver-tndy, there is not much more in the way of secrets than behind the diversity with which the spines of binders can be inscribed: It is plainly convention.

So that Fritz Mueller and Franz Mayer can look at the same graphics, and so that their computers can communicate with each other, common conventions are needed. One way to handle this is to connect to an "agent" who translates the language of manufacturer A into that of manufacturer B.

If the incompatibility of both systems runs very deep so that comprehensive recoding is required, this agent itself must be a large computer. In other cases, it just consists of a program.

When many computers are to take part in a common network, the number of agents increases very rapidly, for every computer needs its own agent for the computers of every other manufacturer. It makes more sense then to introduce a sort of Esperanto. Each needs just a single agent which translates its language into this Esperanto unless its computer already speaks Esperanto.

The International Organization for Standardization (ISO), which includes, for example, the German Standards Institute (DIN) among its members, is trying to develop such an Esperanto. In 1979 it adopted a model framework for communication in open systems (OSI--Open Systems Interconnection). It consists of seven levels built on each other, but each can be independently configured.

The example of the telephone shows clearly how these levels can be grasped. When Fritz Mueller and Franz Mayer carry on a conversation on the telephone about a spectrum, they have to meet the requirements on three levels: They must understand the sense of what the other is talking about and therefore need, for example, knowledge of spectra. They must, however, also understand the language of the other. And they need a communication medium such as the telephone which transports their words physically from Berlin to Munich and vice versa.

All three levels are fully independent of each other, for Japanese without telephones too can consider spectra. German, on the other hand, can be mastered without ever having to hear of spectra. And the telephone cares about neither language nor the content of what is said.

While a steady connection is established between the parties on the telephone which continues during the entire conversation, a more efficient method is used in data communication. Fritz Mueller and Franz Mayer do not continually send data during their telecommunication session, but only now and then, when they, for example, want to make a part of the image a different color.

Therefore, the data are packed into individual packets and sent separately on the path. They can, in the process, take different paths from Berlin to Munich, according to the load on the network. The switching centers decide instantly at the time which path is the most favorable.

Here, the German Research Network falls back on the German Federal Postal and Telecommunications Administration Datex-P packet switching network. This resolves all switching problems in accordance with levels 1 to 3 of the ISO model. Thus, the German Research Network does not have to worry about the connection of new subscribers, erroneous connections and line disturbances. These fall into the area of responsibility of the Federal Postal and Telecommunications Administration.

Levels 4 to 7, however, must be defined by the German Research Network. The user should have the feeling of communicating directly with the other party, be it a human or a computer. Whether the party is in the next room or in another city is to be reflected, if necessary, in the telephone number or in the identification code.

Second is the financial question: How expensive is it to use the network? Is it better to use existing external computer capacities or to expand in-house? A major consideration here is how much the computer centers will charge outside institutions.

The line rates for the Federal Postal and Telecommunications Administration Datex-P Network are relatively low. The connect fee is five pfennigs and transfer of 100,000 characters also costs five pfennigs, plus a time charge of one pfennig per minute. But the monthly base fee of DM 450 is relatively high, at least for the normal load. German Research Network subscribers have to figure typically with annual line costs of DM 10,000.

If effective methods for data communication, in which as little as possible dead information such as voids or black areas of graphics is transferred, are successfully found, this factor should be no reason for the undoing of the German Research Network.

But the use of external computer centers is problematic. Today it is not possible for a university to use a computer center in another federal state. In most cases, computer time is allocated according to a formula among the institutes of a respective university.

At Stuttgart University, a different method has been used for years already. There the facilities originally intended for the computer center are allocated among the institutes. The computer center sells its computer time for this.

This produces higher efficiency on both sides: The institutes consider whether the computer time for a program is actually worth the corresponding money to them, and the computer center has to strive to remain attractive, for the institutes are free to use the money in other ways, for example, for experiment equipment.

Certainly the German Research Network will have a future only when a billing formula on a similar basis is found. Only then will large programs and high data rates be economic on the network. Services with low data yields such as the message system (Computer Based Message System), for example, can however also be amortized as a whole.

For this, a reorientation for all participants is necessary: for the subscribers just as the computer centers or even the German Research Association (DFG), which up to now has not financed computer time because it considered it part of the basic equipment.

In the project phase of the German Research Network, it is, however, first a matter of supply of functions. The first services should evoke broad interest. Already in December of last year, more than a billion characters (1 gigabyte) were sent over the network with the advance versions of the German Research Network protocols. Phase 1 of the project plan with the four basic services, with graphic capabilities, the first user groups and with the connection of local computer networks--comparable to private branch exchanges used with telephones, is to be implemented on a widespread basis by 1986.

Then in the second phase up to about 1988, the German network is to be harmonized with comparable networks abroad. Naturally, if possible, this may be done already right at the outset. But the projects are now to be implemented even if international agreements are not yet in sight.

The Federal Ministry for Research and Technology is supporting the development and the initial operation of the German Research Network, for which at the moment some DM 30 million are being appropriated. Then the annual contributions of the association members--DM 10,000 for firms, DM 5,000 for large research institutes and DM 500 for universities--and the usage fees should cover the costs.

Project applications can be filed by each interested institution. The Technical Committee checks whether they are technically suitable and whether they fit into the overall concept. The association is also allocating itself, however, research jobs for possible future developments.

In the long run, the software packages of the German Research Network should also appear in the catalogs of computer manufacturers and software houses. Anyone interested can buy them, connect to the German Research Network and use its capabilities--access authorization to the individual computers is required at the time.

With that a problem is addressed, one that no computer network avoids, and much less still an open network such as the German Research Network: the problem of security.

Security is always in conflict with simplicity and convenience. Scaled measures must be provided in the German Research Network, for a common notice of a special lecture through the mail system certainly requires less protection than a VLSI design for a circuit of commercial interest.

In any case, the real purpose of the German Research Network must not be obstructed by security barriers set too high: to make the total computer capacity accessible to each research institute of the Federal Republic of Germany, from the small engineering office to the large research center, and to make an efficient communication medium available for research purposes.

8545
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SCIENTIFIC AND INDUSTRIAL POLICY

DM 28.2 MILLION FOR NEW SAARBRUECKEN TECHNOLOGY CENTER

Munich COMPUTERWOCHE in German 29 Mar 85 p 64

[Article: "Construction Costs Amount to 28.2 Million Marks: Technology Center for Saarbruecken"]

[Text] Saarbruecken (vwd). One of the largest centers of innovation and technology in Europe is expected to arise in the next few years in Saarbruecken. The construction costs which must be met to accomplish this project are estimated to be as much as 28.2 million marks.

According to Saarbruecken still-functioning mayor, Oskar Lafontaine, and according to the business manager of the Saarbruecken Company for Innovation and Enterprise Promotion, Norbert Walter, those businesses will establish themselves here which deal principally in new forms of engineering and technology. They say that the logic and purpose of this technology center will be to create an infrastructure founded in the areas of research and product development. In addition, it will be possible, they say, in the future to offer companies joining this project opportunities for production on a large scale.

Floor space has already been assigned to the first four enterprises in the largely completed administrative building of the new technology center. The city of Saarbruecken, according to Lafontaine, is negotiating now with 25 additional enterprises and interested parties. He himself considers that the center offers "a good opportunity for new plant location." It is expected that primarily energy-conserving and material-conserving technologies will be developed.

The city of Saarbruecken has a 60-percent share in the financing of this project, involving more than 28 million marks. Only a quarter of the financing volume will be covered by funds from the EEC special steel program for revitalizing inactive industrial areas. The rest of the cost is being taken over by the Saar.

8008
CSO: 3698/604

SCIENTIFIC AND INDUSTRIAL POLICY

NIXDORF RESEARCH ACTIVITIES IN PADERBORN, BERLIN

Frankfurt/Main FRANKFURTER ZEITUNG/BLICK DURCH DIE WIRTSCHAFT in German
28 Jun 85 p 4

[Article by Herbrt F. W. Schramm: "How Nixdorf Gives Mobility to Product Development: Innovation in German Office Technology and Information Technology (6)"]

> [Text] The showcase representative enterprise for the German computer industry has again and again been quick to become engaged in the most modern system technologies. For example, with its digital communications systems. On the other hand, the Nixdorf Computer Company, Paderborn, continues to cling today to product families which have quite a long history behind them. For example, the company still adheres to the 8870 and 8864 systems which were brought out in 1976. Might one call this innovation with lights and shadows? In the course of its unconventional product development the firm has protected the "old-timer" systems from technical stagnation and has at the same time placed beside them a broad spectrum of new systems. The Paderborn people are allowing their development expenses to grow so that the company will grow. And they maintain their mobility by dispensing with regulations which would otherwise readily become institutionalized. The last article in this series appeared on 24 May. The Editors

Planning "From the Bottom Up"

About 1,000 people are active in development areas at the company's central headquarters. The teams in Paderborn are occupied with multiplace text systems of the 8840 family, with the 8860 computer family for network applications, with the 8870 business computers and other workplace systems as well as with the mainframe computers of the 8890 family. An especially extensive field of problems also has to do with further development of the 8818 digital communications system. In cooperation with a team in Munich the development of the error-tolerant information system 8832 is being pushed.

In recent days Nixdorf has much broadened his development activities which have been going on for many years at the Berlin headquarters. Here at the present time two development companies are active with about 320 workers. One company is dedicated to the 8812 system, which supplies comprehensive computerized solutions for business, and also to business communication systems as well as to the production of magnetic disk drives. The other company was founded in 1984 and carries out developmental studies in communications engineering. In Munich about 40 workers are involved in development work. In cooperation with Berlin products are being produced here in the domain of communications engineering, with Paderborn's software and monitor systems for the 8890 computer system together with component solutions for the error-tolerant system 8832.

Their efforts in the United States have resulted in further development shops which are assigned to the Nixdorf Computer Corporation in Boston. The American subsidiary is responsible for the further development of the 8850 data preprocessing system and also for the "intelligent" workplaces 8810/65. A special staff in Richmond, Virginia, is concerned with the IBM-compatible NIDOS/VSE operations system. Altogether in the United States 220 workers have been entrusted with development tasks. In addition, Nixdorf is maintaining technology centers in Santa Clara (Silicon Valley) and Tokyo which carry out important preliminary studies for all development areas. They provide information to the company and investigate new products. They function not least of all as clearinghouses for cooperation with partner companies and suppliers.

All of these activities are controlled centrally by the board authority for development in Paderborn. This authority includes among its tasks the coordination of projects and the exploitation of synergistic effects. Questions relating to the budget are also naturally handled at the board level. Financial outlays are planned on a project-oriented basis in accordance with the preliminary suggestions made by the development divisions. In other words, these expenditures are planned "from below up." In the last business year these expenditures ran to a total of 323 million marks. Recent years reflect the extent to which the company has been steadily enlarging its innovative activity. In the business year 1982, 8.7 percent of the company's annual sales was applied to research and development; in 1983 the figure was 9.3 percent and in 1984 almost 10 percent.

Many specialist-observers justifiably attribute the marked growth of the company primarily to the energy of its marketing. But the same characteristic is also observable in all the company's other areas. Nixdorf preserves a high measure of flexibility and mobility by dispensing with regulations which have been firmly laid down in many other companies of the same order of magnitude. This same style is also characteristic of the company's activities in product development: the teams are expected to be able to act, decide and cooperate in accordance with the requirements of the situation.

8008
CSO: 3698/603

SCIENTIFIC AND INDUSTRIAL POLICY

SPECIAL FRG COMMISSION BRINGS TECHNOLOGY TO POLITICAL ARENA

Stuttgart VDI NACHRICHTEN in German 12 Apr 85 p 3

[Interview with Dr Josef Bugl, designated chairman of the commission of inquiry, parliamentary deputy: "'We Are Condemned To Be Successful': The Commission of Inquiry To Evaluate the Effects of Technology Takes Up Its Work--Clarity of Understanding Increases the Chances for Acceptance"; date and place not specified]

[Text] After efforts extending over many years legislation has now emerged in the German Bundestag setting up a commission of inquiry to evaluate the consequences of technology. During the month of April this commission will have its initial constitutive session. The background and the goals of this commission were discussed by this publication, VDI NACHRICHTEN, with the commission's designated chairman, parliamentary deputy, Dr Josef Bugl.

VDI NACHRICHTEN: A short time ago a cabinet commission under the title "New Technologies" was in operation, there already exists a commission of inquiry into genetic technology and now we have the "technology consequences evaluation" commission of inquiry. What is the background for this present intensive technology discussion on the political plane?

Bugl: No one today can dissociate himself from the impetus with which the new technologies are entering our lives. We have learned from the problems which arose in connection with the acceptance of nuclear energy. In that instance the discussion was carried out mainly in public. , But we must try to discuss in Parliament the problems which we encounter and not only outside.

VDI NACHRICHTEN: And what are the particular motives which led to the "technology consequences evaluation" commission of inquiry?

Bugl: They were above all

i. the view that in the parliamentary system of the Federal Republic of Germany the evaluation of the consequences of technology is a task of government and

ii. the view that the scientific basis has still not been established with sufficient firmness.

Both arguments are valid to a certain extent. But in my view Parliament also has the task of informing itself with regard to the effects of technology upon the various areas of life--and this it should do independently of the executive branch of the government. Only then will it be able to carry out its task of helping to shape the boundary conditions of technological development.

VDI NACHRICHTEN: How big is the commission of inquiry for evaluating the consequences of technology and what is its composition?

Bugl: Nine deputies are members of the commission. Four from the CDU/CSU fraction, three from the SPD, one each from the FDP and the Greens. In addition, there are eight expert witnesses. Even in selecting the deputies it was borne in mind that colleagues from the most varied areas of work should be taken into consideration. In the case of the expert witnesses the task is more difficult: here, inter alia, there is representation of the tariff partners (BDI-DGB). Nevertheless, the representatives of these groups are not on the commission only as representatives of their guilds but also as specialists in specific problem areas. The expert witnesses called upon thus far include a generalist, an economist who is concerned particularly with questions of innovation, an engineer and a representative of industry. But the selection of expert witnesses has not yet been finished.

VDI NACHRICHTEN: And how does the commission do its work?

Bugl: The program of work and the sequence of activities are determined by the commission itself. As in the case of other commissions of inquiry the specialized knowledge of experts will be called upon. In this process studies will be carried out not only internally but investigative contracts will be placed outside the commission and there will be hearings of representatives of specific segments of society.

Before selecting individual working topics we must develop criteria to determine our focal points. In no case do we want a prior restriction to particular problem areas.

And there is also another problem: In choosing our subject matter we shall certainly make use of conclusions which others have already reached in this area of evaluating the consequences of technology but we must also give our attention from the outset to those topics and illustrative cases on which it is possible to have a consensus. If we cannot have a consensus then in my view we have lost the game. I should very much like to present the report to the Bundestag at the end of the legislative period and be able to say: We have investigated this new instrument for evaluating the consequences of technology and we propose this or that possible course to the German Bundestag as to ways in which such an instrument could be permanently institutionalized.

VDI NACHRICHTEN: Will the commission consider only those aspects having to do with the FRG or will it also include questions relating to European or international technological policy?

Bugl: The evaluation of the consequences of technology requires that all immediate and indirect consequences of a technology should be subjected to analysis. Certainly to this extent attention will have to be given also to European and international aspects of the matter.

Also in working up our initial concepts and methods we shall orient ourselves with regard to international studies relating to the evaluation of the consequences of technology.

VDI NACHRICHTEN: Is the main tendency of your investigations directed more toward social consequences (unemployment, more free time) or more toward purely technological consequences?

Bugl: Evaluation of the consequences of technology must concern itself with the entire spectrum of the effects of a technology. Thus both the social, the economic and the technological consequences as well as consequences for the environment and other aspects of the question will be taken into account.

VDI NACHRICHTEN: What will be the significance of this evaluation for industry?

Bugl: The evaluation aims at weighing opportunities and risks. In other words, we are also analyzing the chances for a new technology to influence our economy, in the sense of helping industry. But in no case do we want to turn this evaluation instrument into a pure instrument for exercising control. In particular cases--such as the case of structure policy--that may be both possible and necessary as, for example, in the instance of nuclear energy. The latter would not exist to its current extent without a policy of massive state support.

VDI NACHRICHTEN: Does the commission for the evaluation of the consequences of technology also have any ulterior purpose?

Bugl: One might speak in those terms. It is one of our goals to make discussion of the new technologies more transparent and by means of this transparency also increase the probability of acceptance within broad circles of our society. In this connection, too, the choice of topics for the commission is important: we need topics which possess resonance for the general public. But I would like once again--also in view of the short time available--to warn against exaggerated expectations.

VDI NACHRICHTEN: How are you going to maintain a communications link with the outside?

Bugl: We shall report on our work continuously whenever there are decisive results. We shall also have to maintain contact with the individual Bundestag committees, particularly with the Business Rules Committee; in fact that is the committee which must finally give its approval. Of course, I should like to avoid excessive bureaucratization.

VDI NACHRICHTEN: When is the first report expected and what phase will it handle?

Bugl: By contract the commission must present a report on the result of its work by 31 December 1986. The content of the report will be subdivided in accordance with the three tasks of the commission: these are:

i. the identification of technologies and engineering lines of development for which at the present time there exists a need for information and action;

ii. the exemplary performance of penetrating analyses of specific technologies in selected areas of effect;

iii. the clarification of the question regarding possible methods of meeting Parliament's need for information in the future.

The work which we have to accomplish is thus extraordinary in view of the scanty reporting time. Only if all members of the commission stand together in solidarity and work together intensively on this task will we obtain a result worth showing. Only thus, too, will we create in the Bundestag a permanent institutionalization of the evaluation of the consequences of technology.

VDI NACHRICHTEN: What do you mean to achieve through an institutionalization?

Bugl: I would visualize a steering committee, a sort of coordinating and guiding committee which would be superimposed upon the existing consultation capacities. This committee could then also be integrated into the international efforts which are taking place in this area; for example, with the Japanese, American and French initiatives in the evaluation of the consequences of technology.

VDI NACHRICHTEN: What is the function of such a steering committee?

Bugl: The primacy of the political order must be preserved. Such a committee with its competence will influence the decisions of the politicians--possibly right up to the legislative level. Political decisions must become "scientificized," so to speak. But the commission is not a decisionmaking panel: we can only make suggestions to the German Bundestag. In the end it is the latter which makes the decision. We have only a consultative function. But let me emphasize once more: we should not pitch our hopes to high; we have only limited funds and only a year and a half of time.

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SCIENTIFIC AND INDUSTRIAL POLICY

BRIEFS

POSSIBLE JAPANESE EUREKA PARTICIPATION--On 19 June, the European Commission announced that Japan was interested in participating in the future European advanced-technology research program "Eureka." In a communique, the Brussels Commission indicated that the Japanese prime minister, Mr Hasuhiro Nakasone, had "expressed interest for the Eureka program and for a possible cooperation with the Community in this field," during a meeting with Mr Karl-Heinz Narjes, the Commission's vice president, in Tokyo earlier this week. The Commission welcomed the Japanese request and is considering its answer, a spokesman for the Commission stated. During his visit, from 15 to 18 June, Mr Narjes had conversations with several Japanese ministers, which brought out the fact that the two parties agreed to intensify their cooperation in high-level scientific research, especially on controlled thermonuclear fusion and on new materials, the communique added. In the next few months, experts will meet for an in-depth study of these orientations. The Eureka program for increased European cooperation in technological research was proposed last April by France and will be one of the main subjects discussed at the next meeting of EEC chiefs of states and governments, in Milan (Italy) on 28-29 June. [Text] [Paris AFP SCIENCES in French 20 Jun 85 p 4] 9294

EUREKA 'SUPER ROBOT' CONTEMPLATED--Munich--The West German research minister, Heinz Riesenhuber, indicated on 14 June that the development of a supercomputer, a European robot Eurobot, which would takes the place of man in dangerous work such as mining, could be conceived as part of Eureka. Mr Riesenhuber made this statement in Munich, at the closing of talks with the French research minister, Henri Curien. These talks ended a two-day French-German scientific meeting which brought together representatives of the two countries' industry and research. The projects considered in information technology and computers have been estimated at nearly 7 billion DM (21 billion francs) for the next ten years. [Text] [Paris AFP SCIENCES in French 20 Jun 85 p 5] 11,023

EEC VENTURE CAPITAL PROJECT--Brussels-The European community, in conjunction with the European Venture Capital Association (EVCA), has just launched a venture capital pilot project, the EEC's "New Technologies and Innovation Policy Newsletter" announced. The project's aim is to demonstrate that transnational innovation projects and cooperation between small and medium-sized businesses can be financed, in Europe, by consortiums made up of venture capital firms operating in different member states, despite accounting, financial and fiscal differences in legislation. A contract was recently concluded between the community and EVCA. It stipulates that in 1985 the community will establish a venture capital fund of 1.2 million ECU's. This capital will be made available for different transnational innovation projects, in blocks of 50,000 to 100,000 ECU's. The projects will be selected and submitted to the Commission by the EVCA member firms which make up the European consortiums in charge of these project's needs. Since the venture capital firms which make up these consortiums are required to furnish the majority of the capital stock from their own resources, they bear the greatest part of the risk involved in the projects. The portion subscribed for by the community is limited to 30 percent, reimbursible if the project is a success. [Text] [Paris AFP SCIENCES in French 21 Mar 85 p 3] 9825

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TECHNOLOGY TRANSFER

DISCUSSIONS HELD ON FRANCO-CHINESE SPACE COOPERATION

Paris AFP SCIENCES in French 27 Jun 85 pp 35-36

[Unsigned article]

[Text] Paris--CNES (National Space Studies Center) in Paris has announced that one of the topics discussed last week in Peking, during the meeting of French and Chinese executives and experts, which ended by the signing of "minutes of meetings" on 21 June, was the future Ariane launching of a small Chinese satellite for the study of earth resources.

"This question, along with others, was mentioned as a general topic and nothing concrete has been decided, except that Chinese experts will come to France in September to continue information discussions on this subject," CNES indicates. "A joint interest exists on both sides for an observation platform smaller for instance than the one provided by the French satellite SPOT, which is to be launched by Ariane next November from the Kourou space center in Guyana."

Such a satellite could be launched either piggyback by the Ariane rocket together with a large satellite, or by the Chinese launcher Long March III.

The Peking meeting ended with the signing of "minutes of meetings," on one hand by Sun Jiadong and Zhang Jiging, respectively head engineer and director of the foreign affairs department at the Chinese Ministry for the Astronautics Industry, and by Frederic d'Allest, director general of CNES, and Mrs Michel Chevrel, head of the international relations division in the same agency.

The processing of images supplied by these observation satellites is also mentioned without further comment in the document. Here again, CNES states that "we will see later" what it is possible to do.

The Peking conversations follow many other contacts and conversations between specialists in the two countries who are exploring cooperation possibilities among the two countries.

An "interministerial arrangement" on scientific and technical cooperation in space between Peking and Paris, a sort of framework agreement for this cooperation, had in fact been signed in Paris on 11 February of last year, by Hubert Curien, minister of research and technology, and Li Xu'e, Chinese minister for the astronautics industry, who in particular had witnessed three days earlier, in Kourou, the Ariane launching of two telecommunication satellites, Arabsat (for the Arab League) and Brasilsat (for the Brasil PTT).

The Peking meetings also covered the establishment of a very high frequency (in the 2 GHz band) interconnection network between satellite telemeasurement, tracking, and remote control ground stations which China would like to establish between a number of specialized stations such as Kourou, Toulouse, and so on.

The discussions also covered, CNES adds, future cooperation on launchers. Members of the French delegation visited space laboratories in the Peking region, where the Chinese displayed their knowhow in some of these sectors.

Mutual visits of experts in these various areas of possible cooperation will continue, CNES concludes.

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TECHNOLOGY TRANSFER

FRANCE-GDR: THREE INDUSTRIAL COOPERATION CONTRACTS

Paris AFP SCIENCES in French 13 Jun 85 p 10

[Article: "France-FRG: Three Industrial Cooperation Contracts"]

[Text] Paris--On the occasion of Mr Laurent Fabius's official visit to East Berlin, on 10-11 June, three contracts were signed by French companies and the GDR. The companies are Jeumont-Schneider, Atochem and Lectra System, whose executives accompanied the prime minister.

Jeumont-Schneider signed cooperation agreements providing for a partnership with the East German electrotechnical and electronic equipment ETEI (Electrotechnics Export Import).

The chief executive officer of Jeumont-Schneider, Mr Jean-Martin Folz, estimates that his company's volume of business with the GDR, which amounted to about FF 200 million for the past 3 years, should considerably increase under this agreement. The French company has been represented in the GDR for over 20 years and has already supplied many of the electrical and electronic equipment of the largest steelplant of that country.

Atochem also signed an agreement involving about FF 400 million, in the presence of the East-German minister of chemistry, Mr Jacques Puechal, chief executive officer of the company, stated.

The last agreement involves a small or mid-size company in Bordeaux, Lectra System, a company specialized in computer-aided laser-cutting systems for the textile industry. Two competing systems now exist in this field, one made in the United States and one in France, which was just chosen by the GDR.

Under this agreement Lectra System will start equipping a large GDR factory already next July. Three more orders totalling FF 23 million are expected for the end of 1985, and the agreement for 1986 covers about FF 12 million worth of equipment.

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TECHNOLOGY TRANSFER

BRIEFS

CURIEN ON TECH TRANSFER--Paris-France has "very strict" regulations to prevent "undue" technology transfers, Minister of Research and Technology Hubert Curien, emphasized Sunday. A guest of RTL-Le Monde's Grand Jury, Mr Curien, questioned about espionage in research, first indicated that "the word espionage has no meaning when applied to pure research," then went on to say that with respect to technology transfers "we have very strict regulations. We have adhered to a certain number of agreements with our allies which prohibit us from them." As for scientific cooperation with the Soviets, especially in the area of space, Mr Curien stated that "there was a very clear agreement" with them. "They are well aware," he declared, "that when there are things that would give rise to an undue transfer, we give them black boxes designed to break when someone starts to dismantle them." [Excerpt] [Paris AFP SCIENCES in French 4 Apr 85 p 5] 9825

BULGARIAN-FRENCH MACHINE-TOOLS--MATRA [Mechanics, Aviation and Traction Company] is transferring part of the machine-tool and automation operations of its Manurhin subsidiary to a Bulgarian state-owned company (Machino-Export) and the West-German subsidiary of the latter (Webo). A new company, Manucentre Automatic, will thus be created in Mulhouse (under French law). Manurhin will own 49 percent of the stock. This solution, which could save the company and the jobs of its 250 employees, appears to be satisfactory to the CGT [General Confederation of Labor]. But, of course, this time the foreign partner is Bulgarian... [Text] [Paris LIBERATION in French 11 Jul 85 p 11] 9294

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